

# INFORMATION WARRIOR EFFECTIVENESS (IWE)



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AFRL/HEX

23 Apr 02

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
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1. REPORT DATE (DD-MM-YYYY) 23-04-2002		2. REPORT TYPE Briefing		3. DATES COVERED (FROM - TO) xx-xx-2002 to xx-xx-2002	
4. TITLE AND SUBTITLE Information Warrior Effectiveness (IWE) Unclassified			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Simpson, Rich ;			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME AND ADDRESS AFRL/HEX XXXXX XXXXX, XXXXXXXX			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS AFRL ,			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT APUBLIC RELEASE ,					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT See report.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:		17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 27	19. NAME OF RESPONSIBLE PERSON email from Booz Allen (IATAC), (blank) lfenster@dtic.mil	
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified	19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007		
				Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std Z39.18	

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 074-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 4/23/2002	3. REPORT TYPE AND DATES COVERED Briefing 4/23/2002	
4. TITLE AND SUBTITLE Information Warrior Effectiveness (IWE)			5. FUNDING NUMBERS	
6. AUTHOR(S) Simpson, Lt Col Rich				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)  Air Force Research Laboratory			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)  Air Force Research Laboratory			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; Distribution unlimited			12b. DISTRIBUTION CODE  A	
13. ABSTRACT (Maximum 200 Words)  This briefing about Information Warrior Effectiveness (IWE) was presented during the Phoenix Challenge 2002 Conference and Warfighter Day.				
14. SUBJECT TERMS IATAC Collection, information warfare, information warrior effectiveness			15. NUMBER OF PAGES  26	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT  UNLIMITED	



# The Program



INFORMATION WARRIOR

+

AFRL/HUMAN EFFECTIVENESS



INFORMATION WARRIOR EFFECTIVENESS  
(IWE)

An Integrated Human Effectiveness Research  
Program Focused on the Info Warrior



# Approach

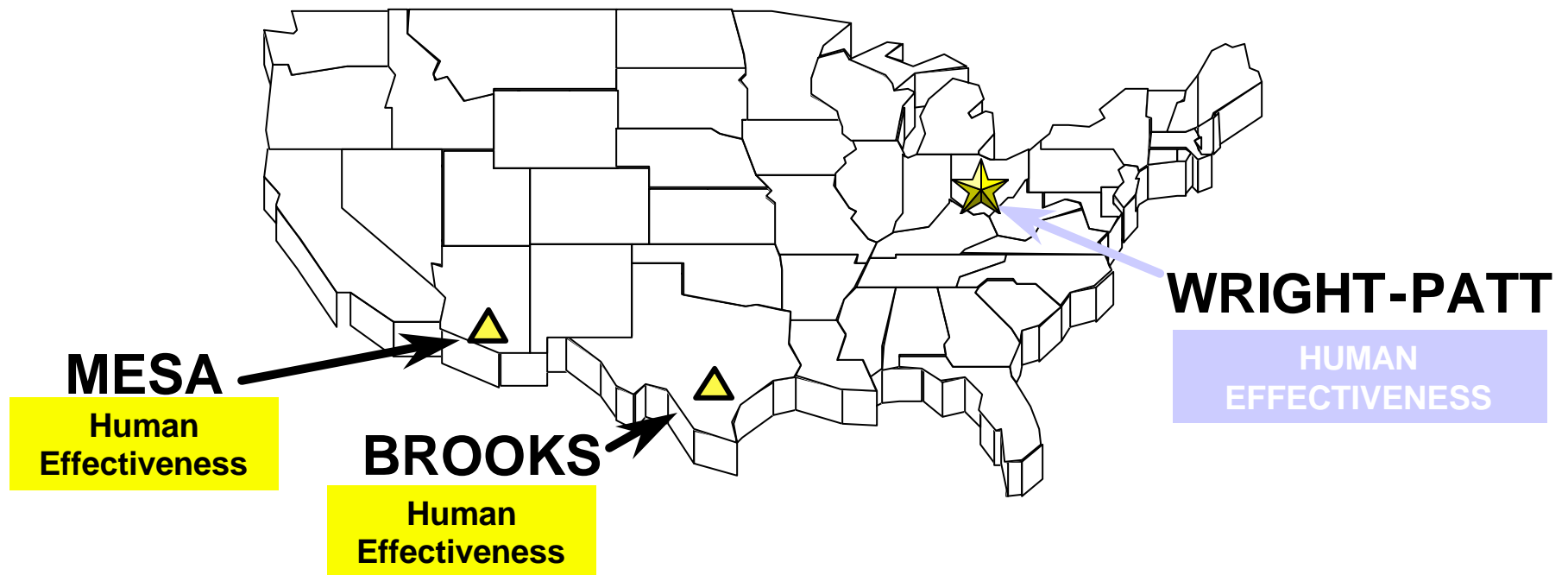
## *Ask the Right Questions*



- How do We Relate Human Effectiveness Research to Information Warfare (IW)?
- What Are the User's Needs?
  - Who Are the Users?
  - What Requirements Have They Documented?
  - What Requirements Are Unknown?
- What Are Our Research Capabilities?
- What Have We Already Done in IW?
  - Cyber CID



# HEX Locations





# Human Effectiveness Technology Thrusts



## Warfighter Training



## Crew System Interface



## Bioeffects & Protection



## Deployment & Sustainment

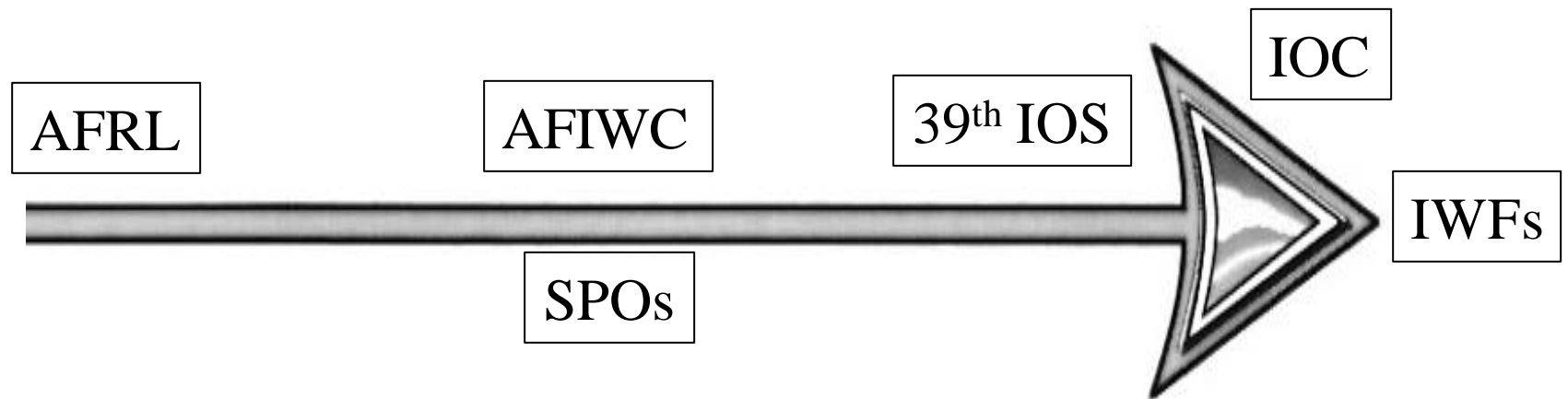


## Core Technology Areas

- |                                      |                                       |                                |  |
|--------------------------------------|---------------------------------------|--------------------------------|--|
| – Distributed Training Tools         | – Visual Displays                     | – Optical Radiation Bioeffects | – Logistics                            |
| – Distributed Mission Training (DMT) | – Aural Displays & Bioacoustics       | – Radio Frequency Radiation    | – Toxicology                           |
| – Night Vision Training              | – Information Analysis & Exploitation | – Biomechanisms Modeling       | – Chemical & Biological Defense*       |
| – Information Systems Training       | – Interface Technology                | – Aircrew Protection           | – Sustained Crew Operations<br>*DoD PE |
|                                      | – Crew Systems Integration            |                                |  |



# Information Warfare

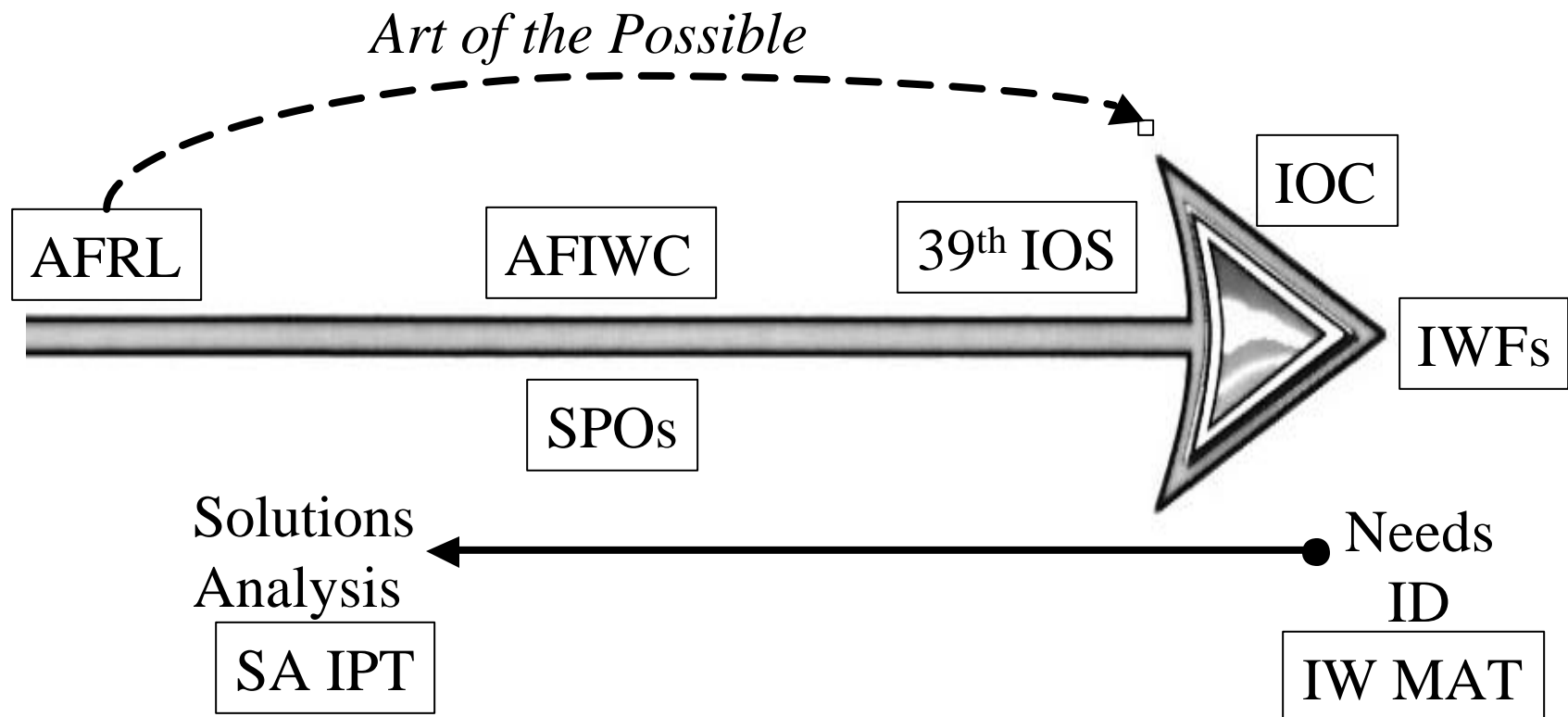




# Information Warfare



Process for identifying needs and finding solutions?  
Air Force Modernization Planning Process





# USAF IW Mission Deficiencies \*\*

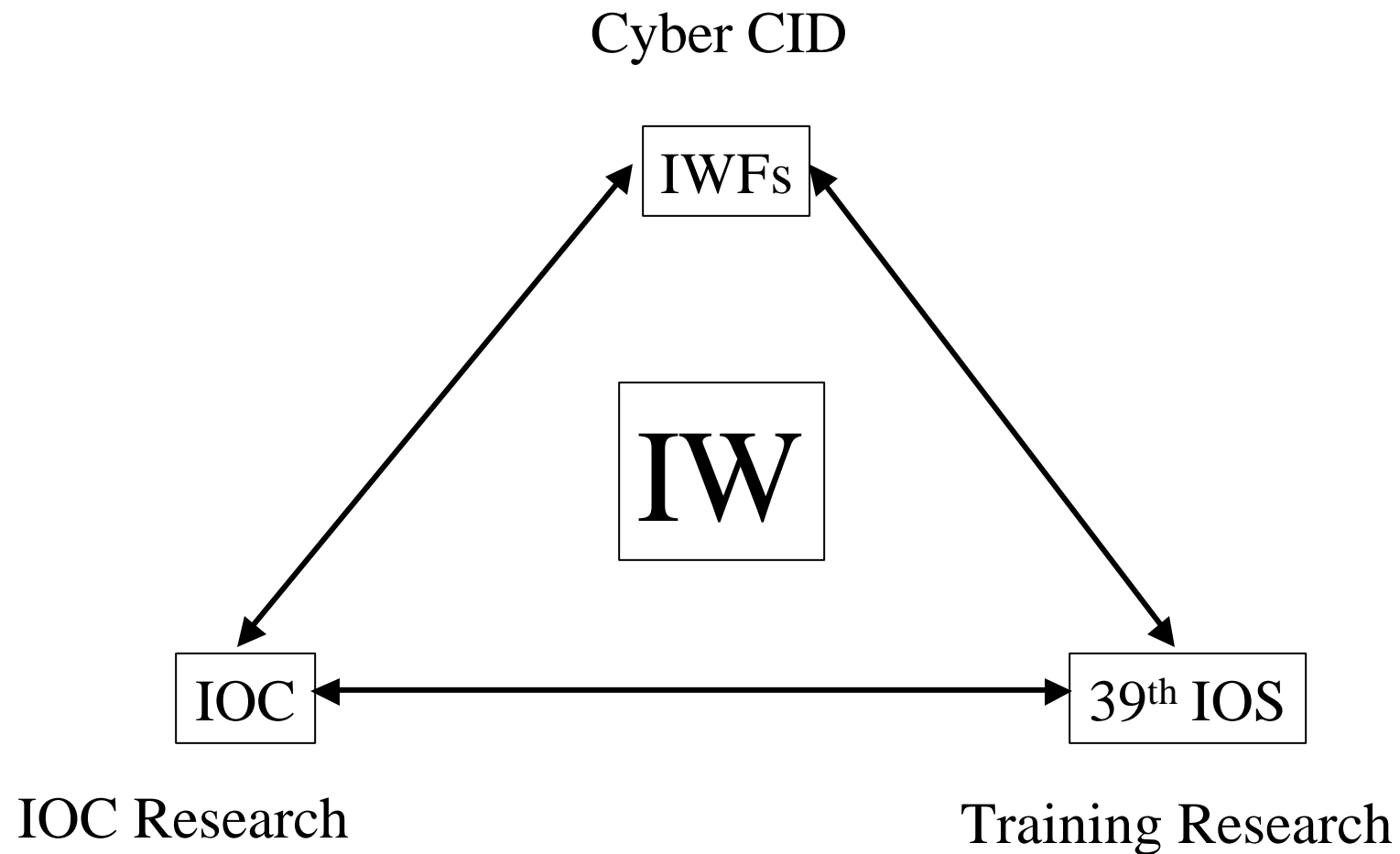
\*\* From FY02 USAF IW Needs Summary



	FY02	FY06
Normalize IO/IW within the USAF	INT 3	
Operationalize IW	INT 4	
Standardize IO/IW terminology, structures, operational environment within DoD	INT 5	
Develop Advanced IW Course	INT 7	
Establish dedicated OPSEC evaluation manpower and funding	OP 2	
Dedicate OPSEC training programs and funding	OP 3	
Need trained, experienced Global Information Grid (GIG) infrastructure and communications system personnel	IA 5	
Need fused, comprehensive personnel profiles, globally accessible and interoperable (IA # )	IA 7	
Need to provide commander with positive control of info resources	IA 15	
Need training programs for GIG maintainers and acquirers, operators, protectors, and users	IA 19	



# Info Warrior Effectiveness





# Cyber CID Cognitive Systems Engineering



## Information Requirements

Defining What Content is Needed for Effective Decision Making

### Supporting Information Needs

D1b.1 Location of combat resources currently which have combat power ranges/effectiveness that include the specified point in time and space.  
D1b.2 Time required to dem such combat, if required.  
D1b.3 Measures of combat power of the combat resources currently within range of the specified point in time and space. (this one needs help)

### Decision Requirements

#### Abstracted Decision

D1 - "Choose combined combat objectives at a specific point in time."

#### Secondary Decisions:

D1a - "Monitor the enemy's state after the enemy reaches the specific point in time and space. (Goal Satisfaction Monitoring)"

D1b - "Choose among the combat resources that can bring their combat power to bear on the specific point in space and time. (Planning process availability)"

D1c - "Estimate the Enemy's state after the application of time." (Planning choice among alternatives)

D1d - "Determine how the selected combat power is initiated and executed." (Control process control)

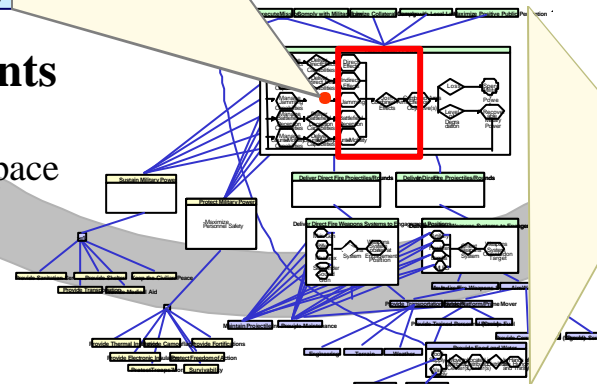
D1e - "After initiation of combat power, determine if it is currently achieving its objectives." (Feedback Monitoring)

#### Side Effects (Other Impacted Goals):

What will the impact be of moving combat power (a) to a specific point in space and time. (i.e., what else were they doing and what will happen if they change assignment?)

## Decision Requirements

Identifying the Cognitive Demands of the Problem Space

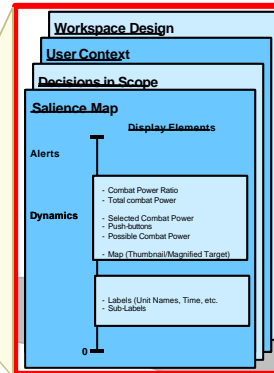


## Functional Abstraction Network

Modeling Critical Domain Relationships

## Display Task Description

Defining Relationship Between Requirements and Visualization Concept



## Display Design Concept

Making the Problem Transparent

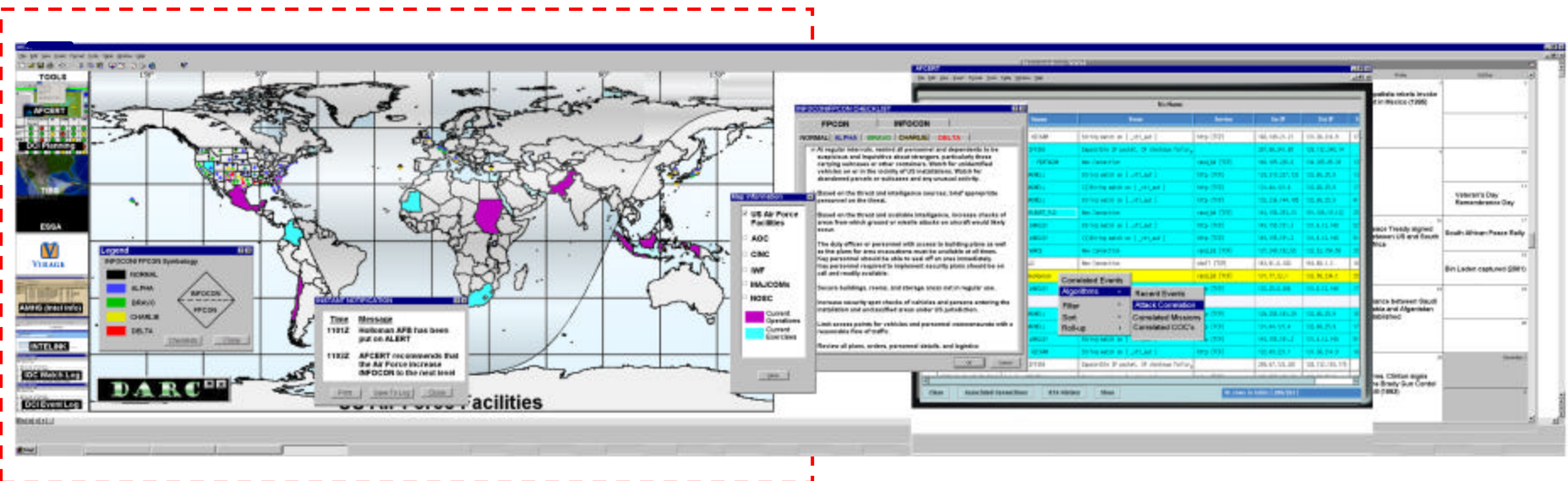


## Warfighter Testing

Ensuring the system is functional & usable.



- Engineer and demonstrate DCI large-screen display (March – April 02).
  - Will not be completed as scheduled due to changes in project priorities (Jan 02 TDY).
    - AFRL/AIA agreed detailed analyses of critical IOC processes and jobs will be required prior to display development.
    - OCI and IIW to be included in future analyses.





# New Objectives

- Milestone 1 Objectives
  - Detailed analysis of the IOC-21 CONOP in the form of a written report.
  - Interview key operators to identify and map processes critical to the success of the IOC mission as stated in the CONOP (to include DCI, OCI, and IIW).
  - Identify and map critical processes that are currently taking place in the IOC (to include DCI, OCI, and IIW).
  - Provide detailed job analyses for critical positions (to include DCI, OCI, and IIW).
  - Identify areas for process and job improvements (e.g., process/job redesign, technology insertion, training, etc.).



# IW Training



- Linking Training Research to 39<sup>th</sup> IOS
- Exploring Application of Existing Training Research for IW
- Investing in Advanced Research Tailored to IW Training
  - Ready to Kick Off Two Small Business Innovative Research Projects Exclusively Focusing on 39<sup>th</sup>
- Application of “Career Map” Research to IW



# Advanced Research (6.2)



- Visualization
- Processes
- Career Planning
- Team Processes
- Distributed Training
- Distributed Ops



## Applied Research (6.3)



- CyberCID
- Human Performance for IW
  - Builds on 6.2 Research
  - Transition Path to Fielded Capability
  - Kicks off in FY03
  - HE-funded 5-year Program



# Approach

## *Ask the Right Questions*



- How do We Relate Human Effectiveness Research to Information Operations (IO)?
- What Are the User's Needs?
  - Who Are the Users?
  - What Requirements Have They Documented?
  - What Requirements Are Unknown?
- What Are Our Research Capabilities?
- What Have We Already Done in IO?
  - Cyber CID



# Human Effectiveness Vision



***“Unleashing the power of human performance through technology”***

- **Prepare the Force**
- **Integrate Personnel with Systems Technology**
- **Protect the Force**
- **Deploy and Sustain the Force**

**Enable an Expeditionary Aerospace Force**



# IWE



***“Unleashing the power of the  
Information Warrior through  
technology”***



## **HEX Points of Contact**

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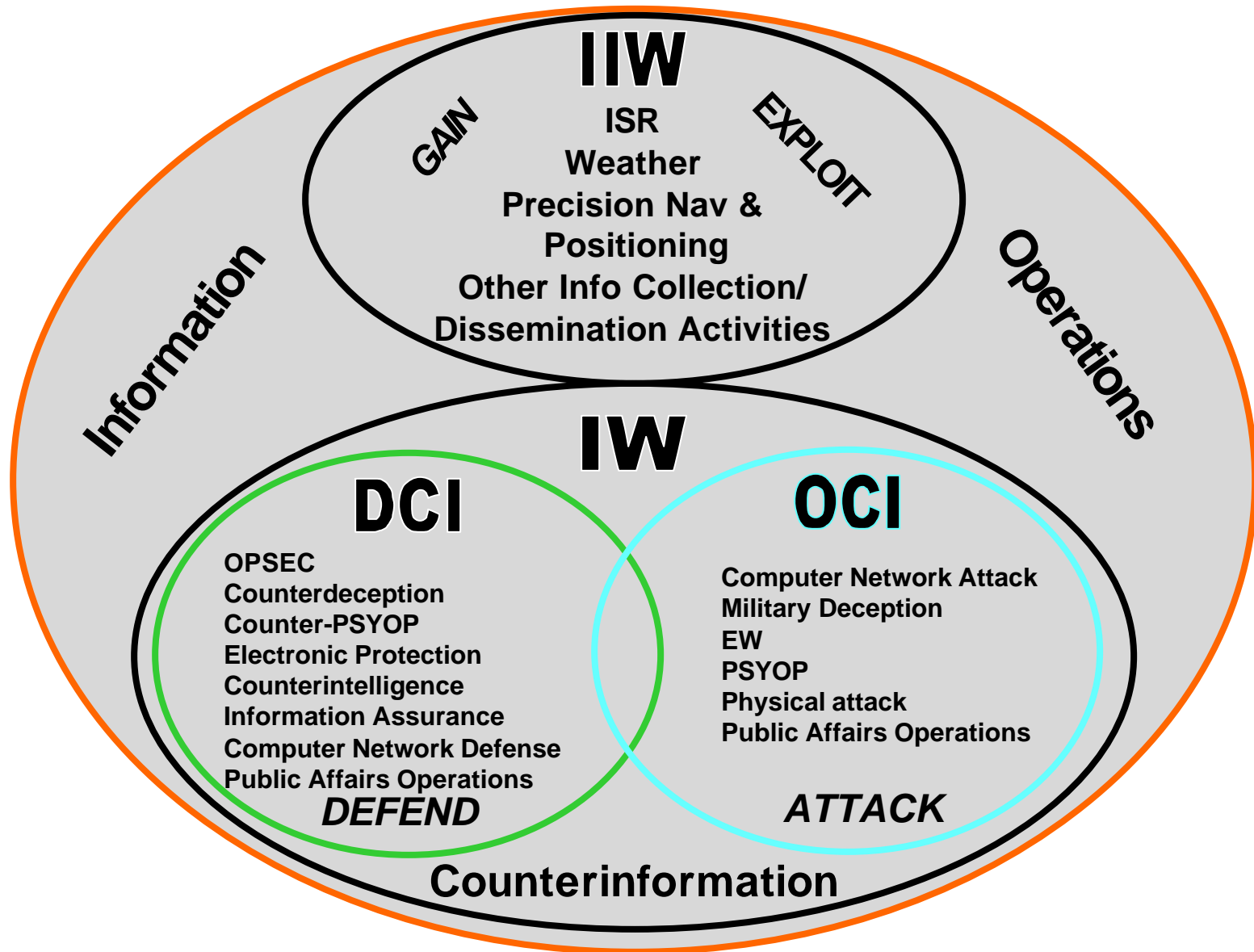
Lt Col Cindy Dominguez, DSN785-5876; [cynthia.dominguez@wpafb.af.mil](mailto:cynthia.dominguez@wpafb.af.mil)



- BACK UPS



# Information Operations Doctrine

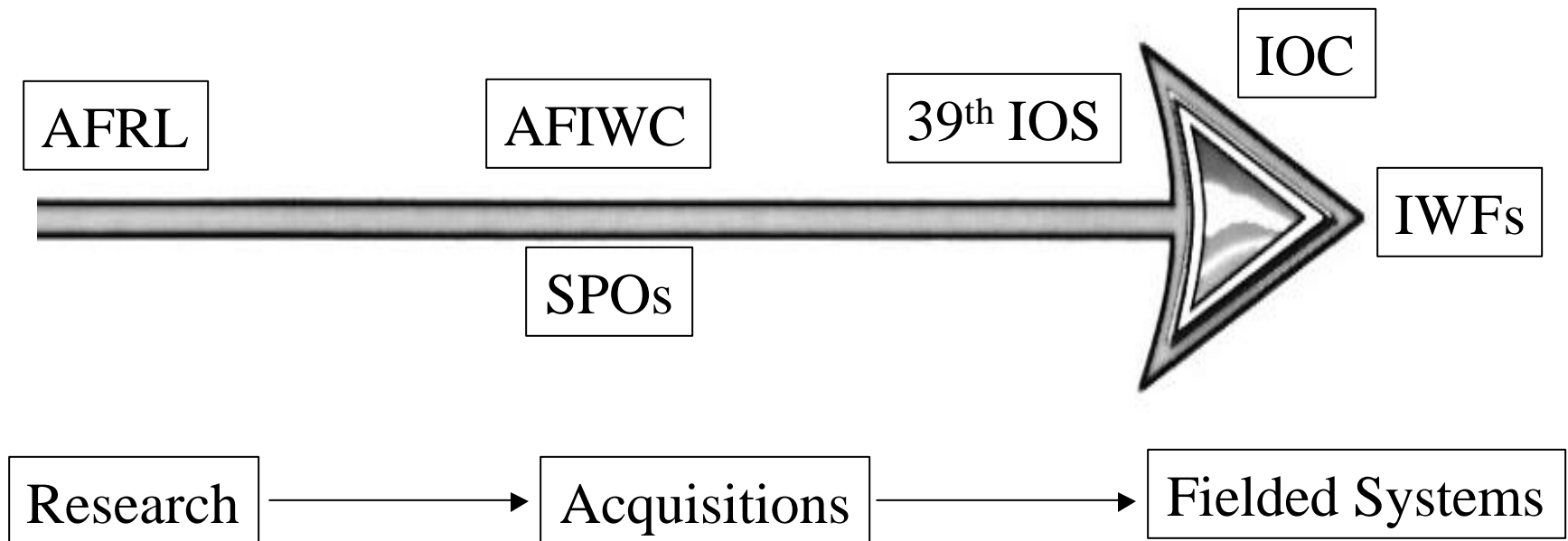




# Information Warfare



## Normalize Acquisitions

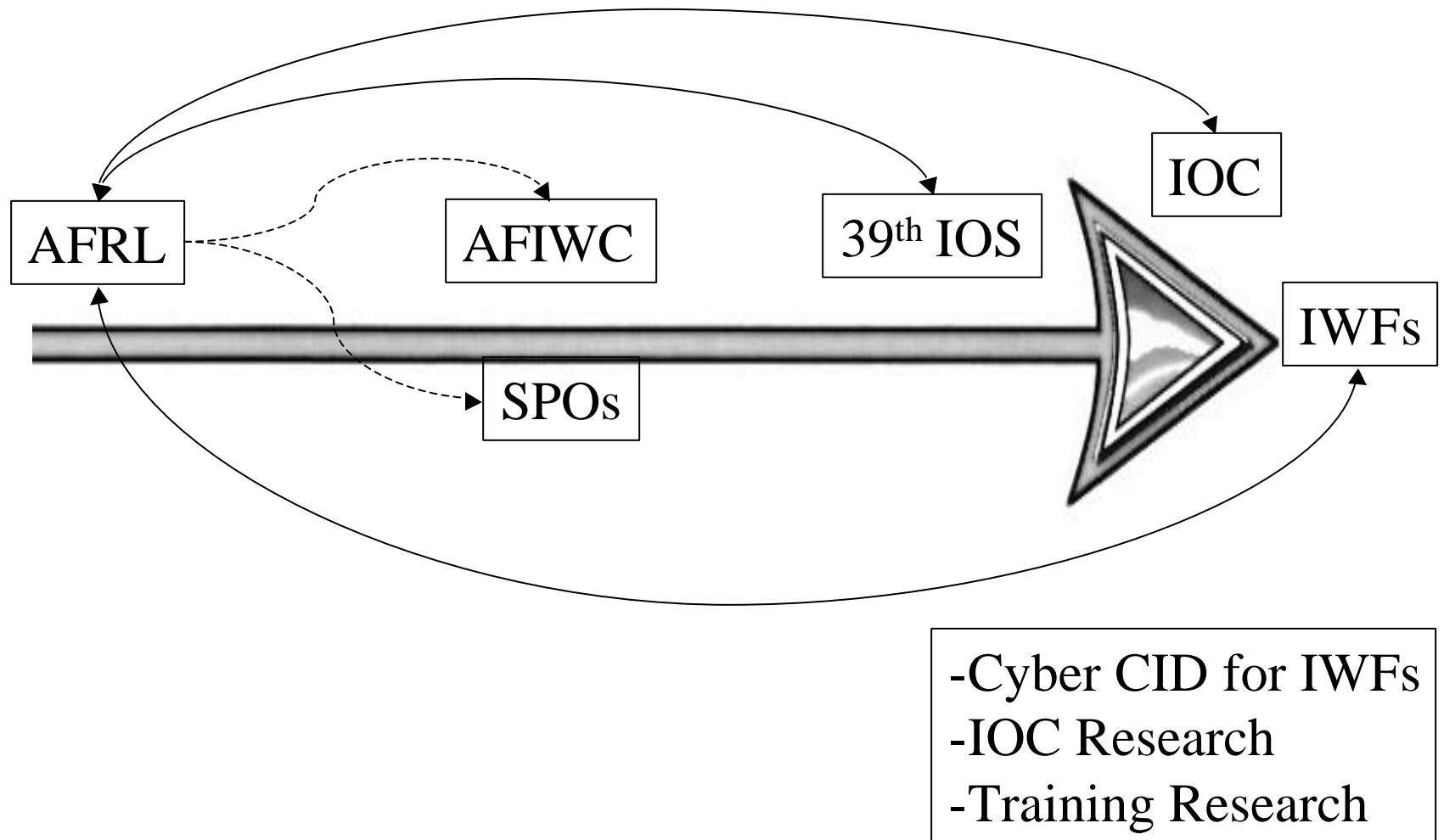




# Information Warfare



## Direct Research and Assistance to Warfighters

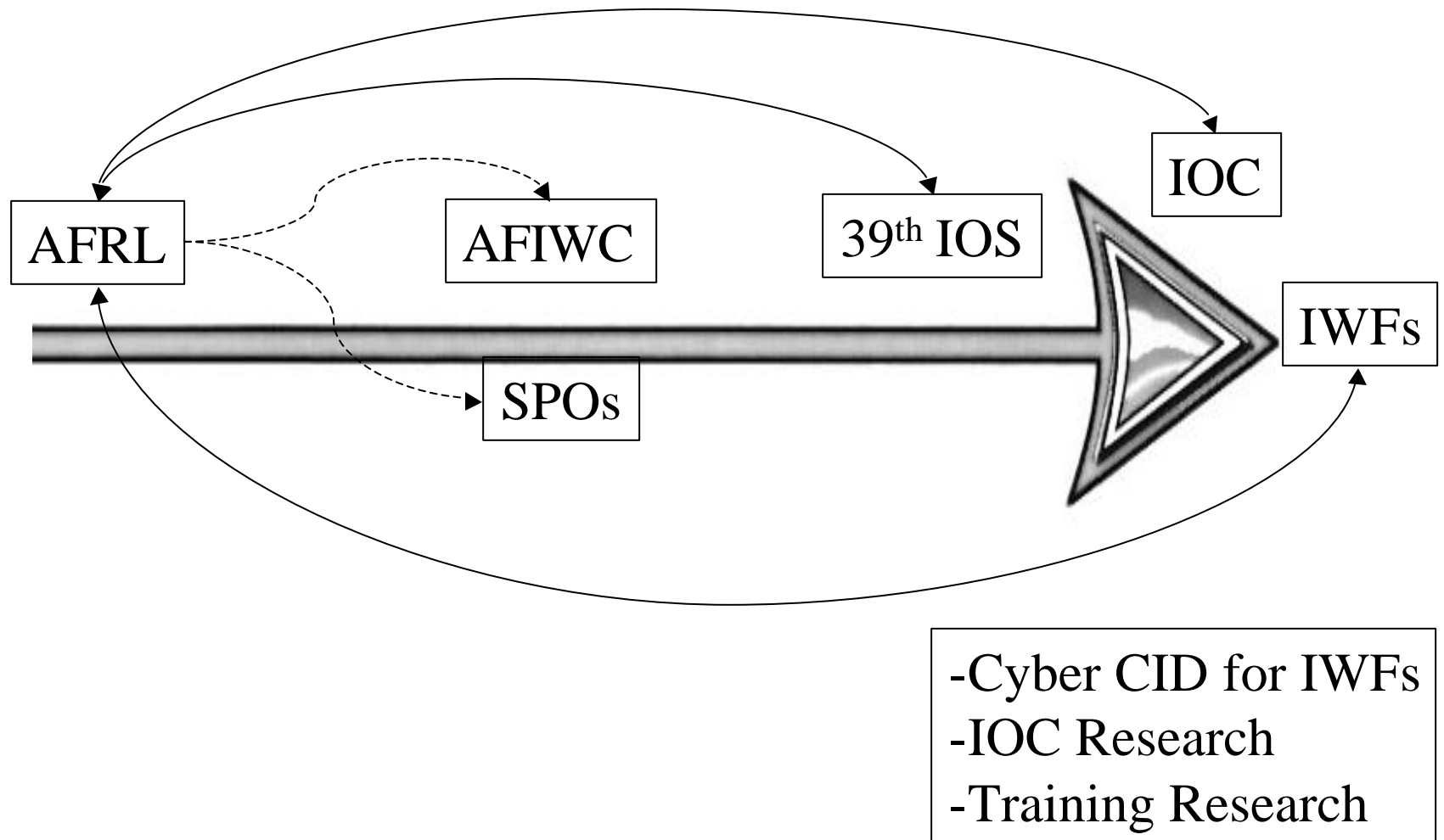




# Information Warfare



## Direct Research and Assistance to Warfighters





# HPIW Benefits to The Warfighter



- Provide the **Commander** With a Near Real Time (<1 Hour Turn Around) Presentation of the Battlespace
- **Integrate** Info Warfare (IW) and Information In Warfare (IIW)
- Provide Near Real-time All-source Data Correlation and Emerging **Threat Characterization**
- Enhance the **Decision Making** Process in Terms of Speed and Accuracy
- Provide Real Time **Collaborative Decision Making** and Shared Virtual **Work Environment**
- **Educate and Train** Professional IO Personnel Using “Real Life” Training Environment Through DMT and Enhanced Simulation



# Proposed HPISR Products



- Intelligence **Analyst** Tool Suite (Includes Hyper-spectral Imaging)
- **Effects-based** Planning and Assessment ISR Control Tools
- ISR Exploitation **Workstation** Concepts
- Distributed Mission **Training** for ISR Operations Personnel



# Human Effectiveness Directorate Organization

